(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **60031231 A**

(43) Date of publication of application: **18.02.85**

(51) Int. Cl **H01L 21/322**
H01L 21/72
H01L 27/00

(21) Application number: **58138857**

(22) Date of filing: **29.07.83**

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(54) MANUFACTURE OF SEMICONDUCTOR SUBSTRATE

(57) Abstract:

PURPOSE: To form a substrate which has characteristics of both an IG(Intrinsic gettering) wafer and an epitaxial wafer by heat treating a low resistance semiconductor substrate at the temperature of 1,100°C or higher, ion implanting an electrically inert impurity to the main surface of the substrate to perform a low temperature heat treatment, and then forming a high resistance single crystal semiconductor layer on the substrate.

CONSTITUTION: A boron-doped P^+ type silicon substrate 11 having approx. 0.1Ωcm of specific resistance is heat treated in dry oxygen atmosphere of approx. 1,250°C to form a high resistance layer 12 having approx. 1Ωcm on the surface region. Carbon ions are implanted to the layer 12 to form a defective nucleus, heat treated by low temperature of approx. 700°C to generate ultrafine defects 13 of high density in the entire interior of the substrate 11. Then, a nondefect P type single crystal silicon thin layer 14 having high resistance such as approx. 5Ωcm of specific resistance and approx. 6μm or thickness is epitaxially grown on the upper surface of the substrate 11. Thus, a semiconductor substrate having characteristics of both the IG wafer and the epitaxial wafer is formed.